

WHAT IS CLAIMED:

1. A nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO:1, wherein the nucleotide sequence is not flanked by sequences adjacent to SEQ ID NO:1 in the native CD91 nucleotide sequence.
- 5 2. A nucleic acid molecule comprising a nucleotide sequence which encodes a polypeptide consisting of the amino acid sequence of SEQ ID NO:2, 3, 6, 7, 8, 9, 10, 11, or 12.
3. A nucleic acid molecule comprising a nucleotide sequence which 1) hybridizes over its full length to the nucleotide sequence of SEQ ID NO:1 under conditions of stringent
10 washing and 2) encodes a polypeptide that is capable of (i) being recombinantly produced and secreted into culture medium and (ii) binding to a heat shock protein.
4. A nucleic acid molecule comprising a nucleotide sequence which 1) hybridizes over its full length to the nucleic acid sequence of SEQ ID NO: 1, 14, 15, 16, or 17 under conditions of stringent washing; and 2) encodes a polypeptide that is capable of (i) being
15 recombinantly produced and secreted into culture medium and (ii) binding to a heat shock protein.
5. A nucleic acid molecule comprising a nucleotide sequence which encodes a polypeptide comprising the amino acid sequence of SEQ ID NO: 2, 3, 6, 7, 8, 9, 10, 11, or 12, wherein said polypeptide interacts with a heat shock protein.
- 20 6. The isolated nucleic acid molecule of any one of claims 1-5, further comprising a heterologous nucleotide sequence.
7. A vector comprising the nucleic acid molecule of any one of claims 1-5.
8. An expression vector comprising the nucleic acid molecule of any one of claims 1-5, wherein the nucleotide sequence is operatively associated with a nucleotide regulatory
25 sequence that controls expression of the nucleotide sequence in a host cell.

9. A genetically engineered host cell comprising the nucleic acid molecule of any one of claims 1-5, wherein the nucleotide sequence is operatively associated with a nucleotide regulatory sequence that controls expression of the nucleotide sequence in the host cell.
10. A host cell comprising the expression vector of claim 8.
- 5 11. A polypeptide comprising the amino acid sequence of SEQ ID NO:2, 3, 6, 7, 8, 9, 10, 11, or 12, wherein the amino acid sequence is not flanked by sequences adjacent to SEQ ID NO:2, 3, 6, 7, 8, 9, 10, 11, or 12, respectively, in the native CD91 polypeptide sequence.
- 10 12. An isolated polypeptide comprising a contiguous amino acid sequence, wherein said amino acid sequence consists of amino acid residues 1-851 of SEQ ID NO:11, fused to one or more contiguous amino acids of amino acid residues 852-4420 of SEQ ID NO:11.
13. An isolated polypeptide encoded by a nucleic acid molecule that hybridizes under stringent conditions to a complement of SEQ ID NO: 1, 14, 15, 16, or 17, wherein said polypeptide binds to a heat shock protein.
- 15 14. An isolated polypeptide encoded by a nucleic acid molecule which hybridizes under stringent conditions to a complement of a nucleic acid molecule consisting of a nucleotide sequence that encodes a polypeptide consisting of the amino acid sequence of SEQ ID NO:2, 6, 8, 10, 11, or 12, wherein said polypeptide binds to a heat shock protein.
- 20 15. The polypeptide of claim 13 or 14, wherein the heat shock protein is selected from the group consisting of a gp96, hsp 90, hsp 70, and calreticulin.
16. The polypeptide of claim 15, wherein the heat shock protein is gp96.
17. A fusion polypeptide comprising the amino acid sequence of SEQ ID NO:2, 3, 6, 7, 8, 9, 10, 11, or 12 and a heterologous amino acid sequence.
- 25 18. A method for making the polypeptide of any one of claims 12-17, comprising the steps of:

- (a) culturing a cell comprising a recombinant nucleotide sequence encoding the polypeptide of any one of claims 11-17, under conditions such that the polypeptide is expressed by said cell; and
- (b) recovering the expressed polypeptide from the cell culture.

5 19. An antibody or fragment thereof that immunospecifically binds to a CD91 polypeptide fragment, wherein the CD91 polypeptide fragment comprises the amino acid sequence of SEQ ID NO.:2, 3, 6, 7, 8, 9, 10, 11, or 12.

20. The antibody or fragment of claim 19, wherein the antibody is a polyclonal antibody, a monoclonal antibody, a humanized antibody, a single chain antibody, or a
10 chimeric antibody.

21. The antibody or fragment of claim 20, wherein the antibody or fragment thereof is a Fab fragment.

22. An anti-idiotypic antibody which binds to the antibody or fragment of claim 19.

23. A kit comprising the antibody of claim 19 and instructions for use of the antibody to
15 detect a CD91 polypeptide fragment.

24. A method for treating a CD91-related disease or disorder comprising administering the polypeptide of any one of claims 11-17 to a mammal in need thereof in an amount effective to treat the disease or disorder.

25. The method of claim 24, wherein the disease or disorder is an autoimmune disorder,
20 a disease or disorder involving disruption of antigen presentation or endocytosis, a disease or disorder involving cytokine clearance or inflammation, a proliferative disorder, a viral disorder or other infectious disease, hypercholesterolemia, Alzheimer's disease, diabetes, or osteoporosis.

26. A method for identifying a compound that modulates an HSP-CD91-mediated
25 process, comprising:

- (a) contacting a test compound with a heat shock protein and a CD91 polypeptide fragment that binds a CD91 ligand; and
- (b) measuring the level of the CD91 polypeptide fragment activity or expression,

5 such that if the level of activity or expression measured in (b) differs from the level of the CD91 polypeptide fragment activity or expression measured in the presence the heat shock protein but in the absence of the test compound, then a compound that modulates an HSP-CD91-mediated process is identified.

10 27. The method of Claim 26, wherein the compound identified is an antagonist which interferes with the interaction of the heat shock protein with the CD91 polypeptide fragment.

28. The method of Claim 26 in which the test compound is a small molecule or a peptide.

15 29. The method of Claim 28 in which the peptide comprises at least 5 consecutive amino acids of the CD91 polypeptide fragment.

30. The method of Claim 26 in which the HSP-CD91-mediated process affects an autoimmune disorder, a disease or disorder involving disruption of antigen presentation or endocytosis, a disease or disorder involving cytokine clearance or inflammation, a proliferative disorder, a viral disorder or other infectious disease, hypercholesterolemia, 20 Alzheimer's disease, diabetes, or osteoporosis.

31. A method for identifying a compound that modulates the binding of a heat shock protein to CD91, comprising:

- (a) contacting a heat shock protein with a CD91 polypeptide fragment, or derivative thereof, which CD91 polypeptide fragment binds a CD91 25 ligand, in the presence of a test compound under conditions conducive to binding; and

- (b) measuring the level of heat shock protein bound to the CD91 polypeptide fragment, analog, derivative or mimetic thereof,

such that if the level of bound heat shock protein measured in (b) differs from the level of heat shock protein measured bound to the CD91 polypeptide fragment or analog, derivative,
5 or mimetic thereof measured under said conditions in the absence of the test compound, then a compound that modulates the binding of an HSP to the CD91 polypeptide fragment is identified.

32. The method of Claim 31 wherein the CD91 polypeptide fragment, or derivative thereof, is immobilized to a solid support.
- 10 33. The method of Claim 32 wherein the solid support is a microtiter dish.
34. The method of Claim 31 wherein the level of bound heat shock protein is measured using a heat shock protein-specific antibody.
35. The method of Claim 31 wherein the heat shock protein is labeled and the level of bound heat shock protein is measured by detecting the label.
- 15 36. The method of Claim 35 wherein the heat shock protein is labeled with a fluorescent label.